Researchers identify new approach to personalize prevention of preterm birth

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New research findings may soon help doctors personalize preterm birth prevention treatments by identifying which women at higher risk for preterm birth will be helped by progesterone injections.

Injections of one type of progesterone, a synthetic form of a hormone naturally produced during pregnancy, have been shown to reduce the risk of recurrent preterm births by about a third.

Nearly half a million babies are born too soon each year in the United States. Preterm birth (birth before 37 weeks of pregnancy) is the leading cause of newborn death, and babies who survive an early birth often face an increased risk of a lifetime of health challenges, such as breathing problems, cerebral palsy, intellectual disabilities and others. Even babies born just a few weeks early have higher rates of hospitalization and illness than full-term infants. It is a serious health problem that costs the United States more than $26 billion annually.

Tracy Manuck, MD, assistant professor of Maternal Fetal Medicine and co-director of the University of Utah Prematurity Prevention Clinic at University of Utah Health Care, has been working to understand why progesterone treatments prevent preterm birth for some women but not for others. She hopes to determine whether there is a way to personalize their treatment based on their genetic makeup. She presented her latest findings at the Society for Maternal-Fetal Medicine's 34th annual meeting, The Pregnancy Meeting.

"This is the first step in using pharmacogenomics to prevent preterm birth," said Edward R.B. McCabe, MD, March of Dimes chief medical officer. "There is a group of women in whom progesterone will be effective and others for whom it will not be and who will need different treatments. Knowing which group a woman belongs to would fast track her to the proper treatment. The goal is to find personalized treatments that work for

individuals to prevent preterm birth."

Dr. Manuck and her colleagues looked at 50 women followed in a prematurity prevention clinic at Intermountain Healthcare in Utah who received progesterone treatment and separated them by whether they responded to the treatment. The team then sequenced all of the areas of the women's genomes that code for proteins and looked for genetic differences between the two groups. The team identified several genes and general biologic pathways that were more likely to be expressed in women who did not respond to progesterone.

"Preterm birth is a complex health problem and it's unlikely that we will find a single genetic cause," said Dr. Manuck. "We know that not all women with a prior preterm birth can be helped by progesterone treatments, and we're trying to identify who those women are."

Dr. McCabe will present Dr. Manuck with the March of Dimes award for Best Abstract in Prematurity at the SMFM's Annual Meeting. 2014 marks the 11th year the March of Dimes award has been presented. Dr. Manuck is a two-time recipient of the honor. She was honored in 2009 for research that looked at progesterone receptors and progesterone response.

"Dr. Manuck has continued to focus her research on progesterone, but her methods have evolved. She has gone from the traditional hypothesis testing approach to a discovery science approach, scanning the landscape to find informative areas and inviting researchers from a variety of disciplines to collaborate with her," said Dr. McCabe. "She's doing important work because she's encouraging people to come out of their comfort zones and cross the boundaries between disciplines."

Provided by Society for Maternal-Fetal Medicine

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